

YAMAHA TX-2000

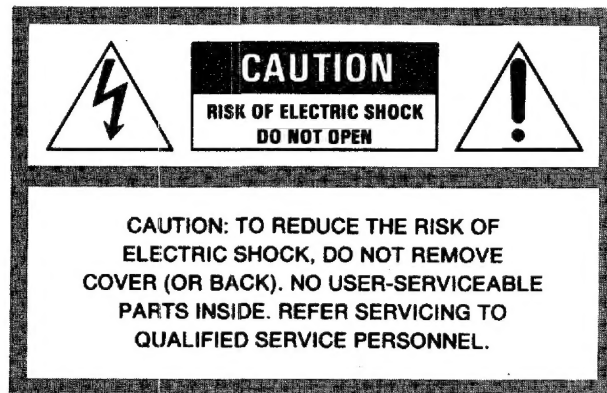
Natural Sound AM/FM Stereo Tuner

Syntoniseur FM/AM stéréo de la série "Natural Sound"

"Natural Sound" MW/UKW-Stereo-Tuner

OWNER'S MANUAL
MODE D'EMPLOI
BEDIENUNGSANLEITUNG

SAFETY INSTRUCTIONS



● Explanation of Graphical Symbols



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

1 Read Instructions — All the safety and operating instructions should be read before the appliance is operated.

2 Retain Instructions — The safety and operating instructions should be retained for future reference.

3 Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.

4 Follow Instructions — All operating and other instructions should be followed.

5 Water and Moisture — The appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

6 Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.

6A An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



7 Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.

8 Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface, that may block the ventilation openings; or cabinet that may impede the flow of air through the ventilation openings.

9 Heat — The appliance should be situated away from heat sources such as radiators, stoves, or other appliances that produce heat.

10 Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

11 Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

12 Cleaning — The appliance should be cleaned only as recommended by the manufacturer.

13 Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

14 Object and Liquid Entry — Care should be taken so that objects do not fall into and liquids are not spilled into the inside of the appliance.

- A. The power-supply cord or the plug has been damaged; or
- B. Objects have fallen, or liquid has been spilled into the appliance; or

- C. The appliance has been exposed to rain; or
- D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
- E. The appliance has been dropped, or the cabinet damaged.

16 Servicing — The user should not attempt to service the appliance beyond those means described in the operating instructions. All other servicing should be referred to qualified service personnel.

17 Power Lines — An outdoor antenna should be located away from power lines.

18 Grounding or Polarization — The precautions that should be taken so that the grounding or polarization of an appliance is not defeated.

19 Outdoor Antenna Grounding — If an outside antenna is connected to the tuner, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges.

Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

A detailed line drawing of a building with a lightning protection system. The diagram shows the following components and connections:

- POWER LINES:** Represented by three horizontal lines at the top left, connected to a utility pole.
- SERVICE ENTRANCE CONDUCTORS:** Two lines entering the building from the left, connected to a meter box.
- SERVICE ENTRANCE EQUIPMENT:** A rectangular box on the left wall of the building.
- POWER SERVICE GROUNDING ELECTRODE SYSTEM (e.g. interior metal water pipe):** A dashed line representing a pipe running along the bottom left wall.
- GROUND CLAMPS:** Two clamps on the left wall connecting the service entrance conductors to the grounding electrode system.
- GROUND WIRE (a):** A wire running along the top edge of the roof.
- GROUND WIRE (a, b):** A wire running along the bottom edge of the building's exterior wall.
- BOUNDING JUMPER (d):** A vertical wire connecting the ground wire (a) to the ground wire (a, b).
- GROUND CLAMP:** A clamp on the roof edge connecting the ground wire (a) to the building structure.
- STAND-OFF INSULATIONS (b):** Two insulators on the roof edge supporting the mast.
- MAST:** A vertical rod extending from the roof edge.
- ANTENNA LEAD-IN WIRE:** A wire running vertically up the mast.
- ANTENNA DISCHARGE UNIT (c):** A component on the mast where the antenna lead-in wire connects.
- TO EXTERNAL ANTENNA TERMINALS OF PRODUCT:** A line pointing away from the antenna discharge unit.
- OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44m) INTO THE EARTH IF REQUIRED BY LOCAL CODES SEE NEC SECTION 810.21 (f):** A vertical rod driven into the ground, connected to the ground wire (a, b) by a ground clamp.

(a): Use No.10 AWG (5.3mm²) copper, No.8 AWG (8.4mm²) aluminium, No.17 AWG (1.0mm²) copper-clad steel or bronze wire, or larger, as a ground wire.

- (b): Secure antenna lead-in and ground wire to house with stand-off insulators spaced from 4 — 6 feet (1.22 — 1.83m) apart.
- (c): Mount antenna discharge unit as closely as possible to where lead-in enters house.

(d): Use jumper wire not smaller than No.6 AWG (13.3mm²) copper, or the equivalent when a separate antenna-grounding electrode is used. See NEC Section 810-21 (j).

- Thank you for purchasing the YAMAHA TX-2000 stereo tuner.

CAUTION: READ THIS BEFORE OPERATING YOUR UNIT.

1. The unit is a sophisticated AM/FM stereo tuner. To ensure proper operation for the best possible performance, please read this manual carefully.
2. Choose the installation location of your unit carefully. Avoid placing it in direct sunlight or close to source of heat. Also avoid locations subject to vibration and excessive dust, heat, cold or moisture. Keep it away from such sources of hum as transformers or motors.
3. Do not open the cabinet as this may result in damage to the unit or electrical shock. If a foreign object should get into the unit, contact your local dealer.
4. To prevent lightning damage, pull out the power cord and remove the antenna cable in case of an electrical storm.
5. When removing the power plug from the wall outlet, always pull directly on the plug; never pull the cord itself.
6. Do not use force when operating switches and knobs.
7. When moving the unit, be sure to first pull out the power plug and remove all cords connecting the unit to other equipment.
8. Do not attempt to clean this unit with chemical solvents as this may damage the finish. Use a clean, dry cloth.
9. Be sure to read the "Troubleshooting" section for this manual for advice on common operating errors before concluding that your unit is faulty.
10. Keep this manual in a safe place for future reference.
11. Voltage Selector (General Model)
The voltage selector on the rear panel of this unit must be set for your local mains voltage BEFORE plugging in the AC mains supply.
Voltages are 110 — 120/220 — 240V AC, 50/60 Hz.

WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION FOR CANADA MODEL:

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

IMPORTANT

Please record the serial number of your unit in the space below:

Model: **TX-2000**
Serial No:

The serial number is located on the rear of the unit.
Retain this Owner's Manual in a safe place for future reference.

Special Instructions for U.K. model

IMPORTANT

The wire in the mains lead are coloured in accordance with the following code:

Blue: NEUTRAL
Brown: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

OBSERVERA!

Stömställaren är sekundärt kopplad och skiljer ej från nätet.

När apparaten ej används bör därför nätsladden ej vara ansluten till vägguttaget.

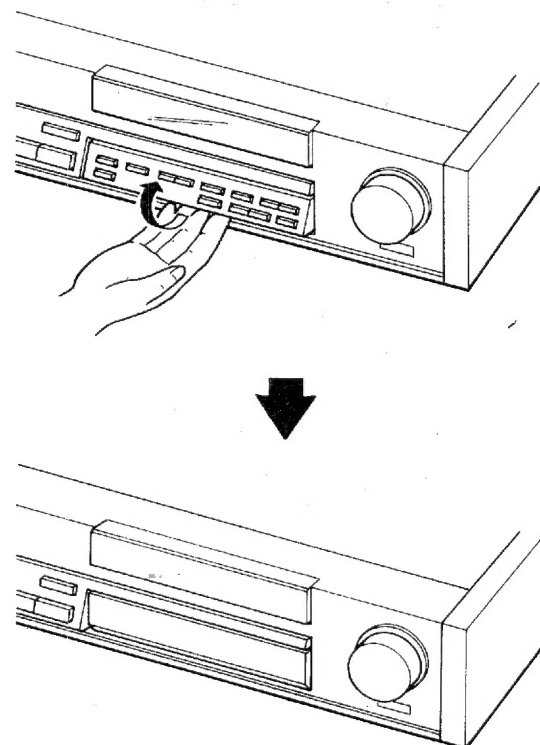
BEMÆRK:

I stilling OFF er apparatet stadig forbundet med lysnettet. Hvis det ønskes fuldstændig afbrudt skal netledningen trækkes ud.

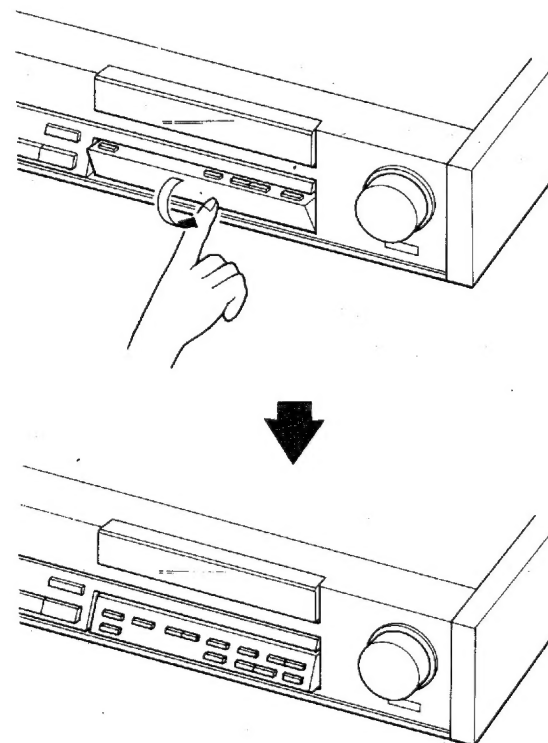
Tipping the operation panel

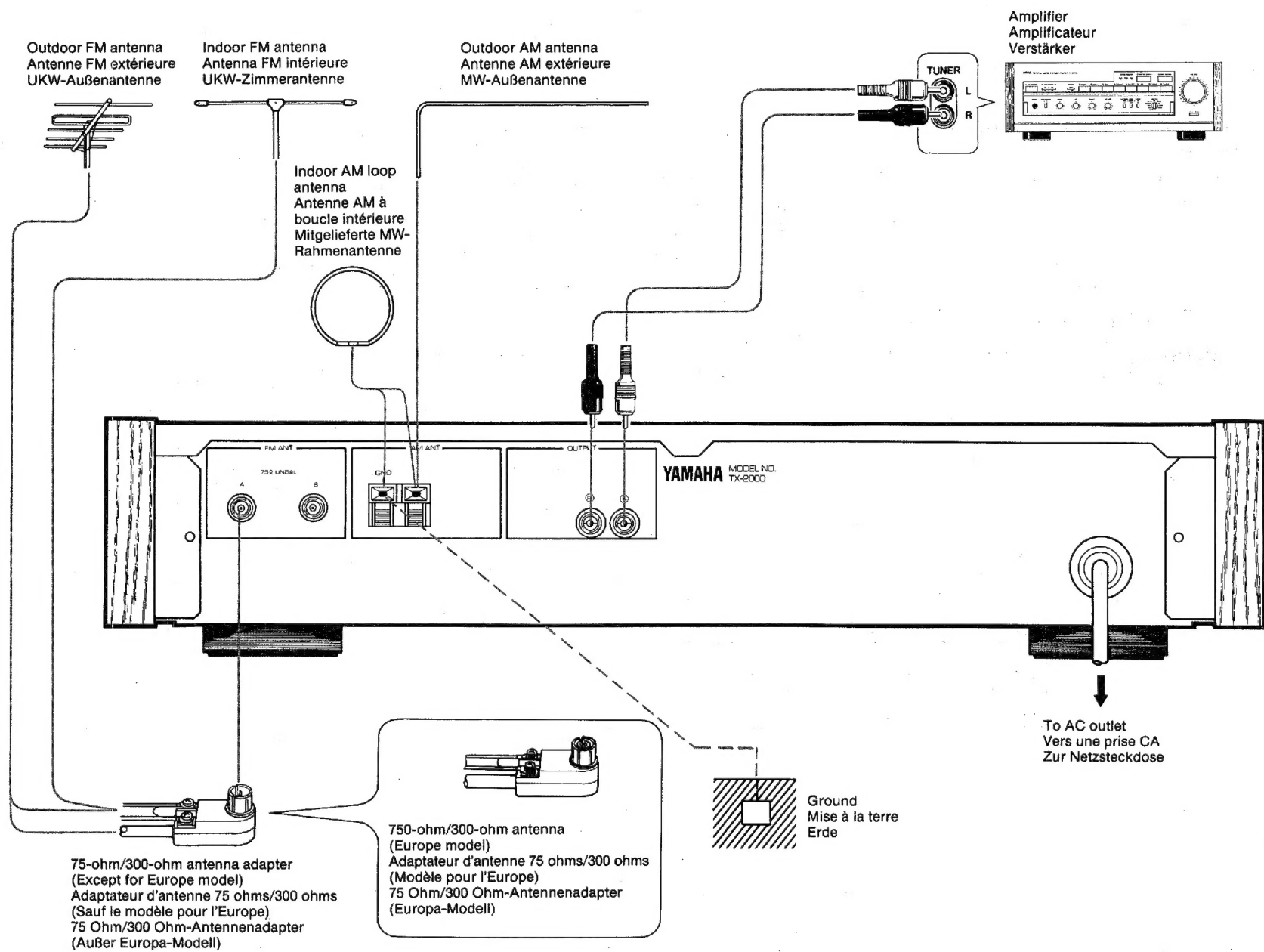
The operation panel, which is located below the display window, may be tipped in and out.

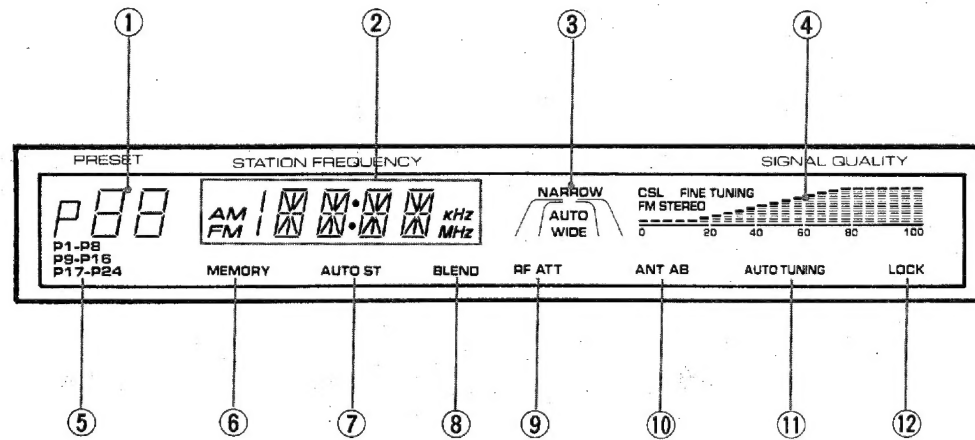
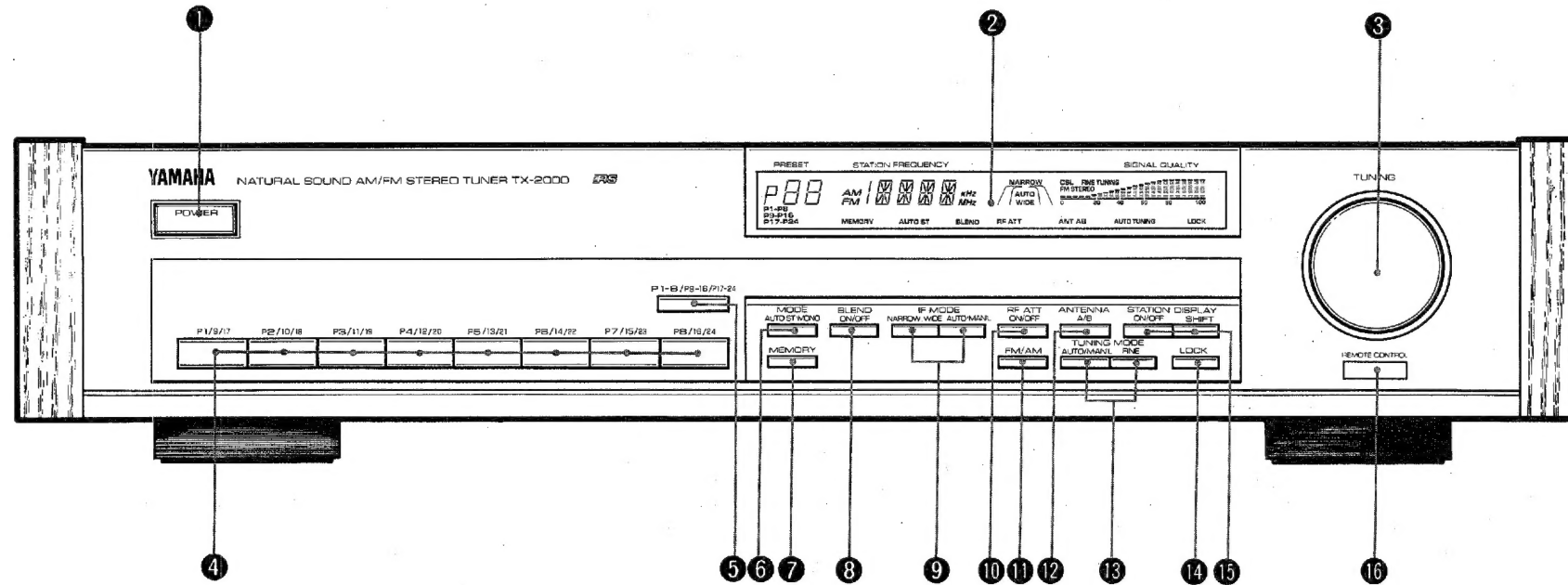
Once the PRESET TUNING operations are complete, it is not necessary to operate these buttons, other than those for the preset stations. Thus, you may tip the operation panel back inside the unit, as shown in the figure.



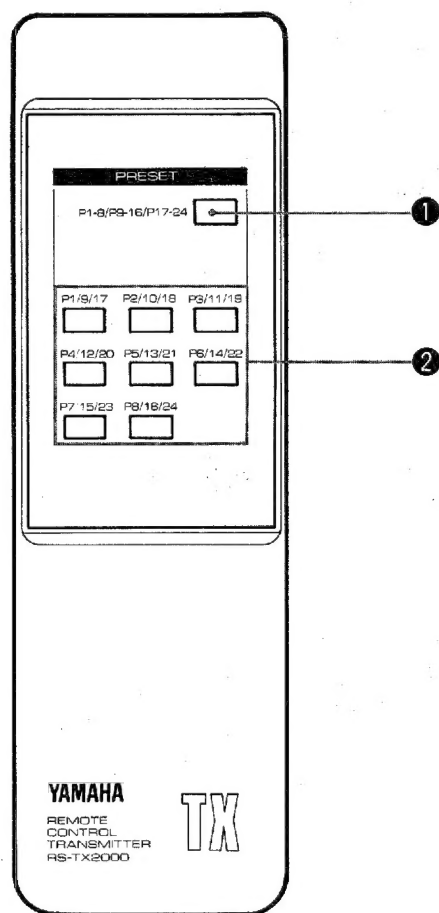
When the operation panel is desired, tip it toward you, as shown in the figure.



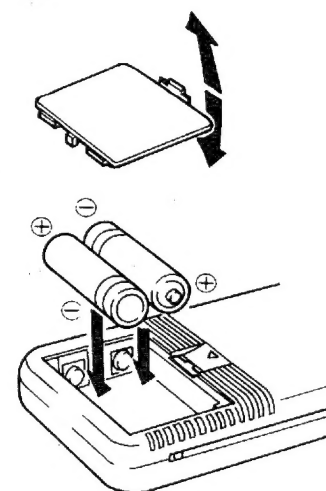




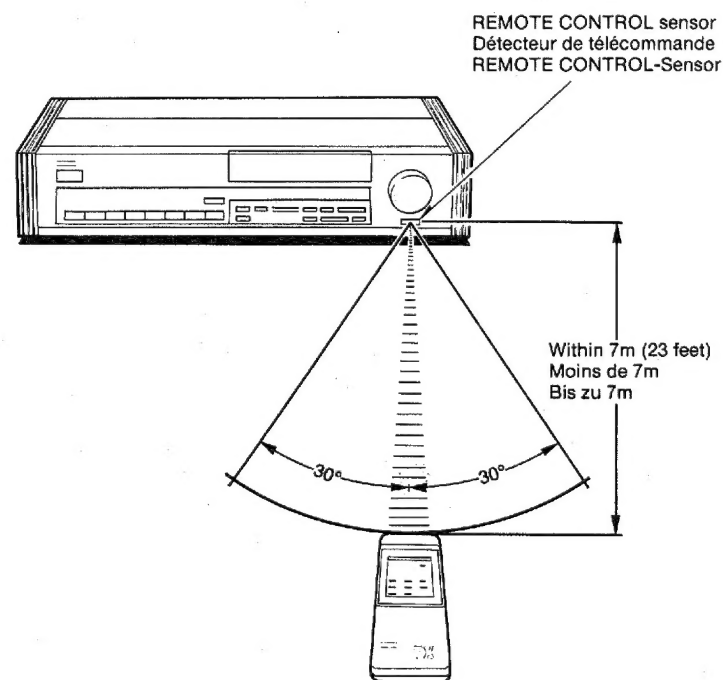
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4



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NOTES ON ANTENNAS

AM ANTENNAS

- **AM loop antenna**

Tune to your favorite AM station and then position the loop antenna for best reception. Try other stations, and find the position that gives the best overall reception.

- **AM outdoor antenna**

In steel buildings or at a great distance from the transmitter, it may be necessary to install an outside long wire antenna.

FM ANTENNAS

Your tuner approaches the theoretical limit for FM sensitivity. However, the performance of your system is determined to a very large extent upon the signal conditions where the antenna is placed. The reason for this is that FM broadcast signals travel in straight paths. Therefore they can be blocked by natural or man-made obstructions, such as mountains, hills, or buildings. At large distances from the transmitter the curvature of the earth acts as a screen between the transmitter and receiver.

Consider the signal conditions when planning your installation. If you live in or near an urban area, the supplied indoor antenna may serve your needs adequately.

However, if your favorite stations are weak due to natural obstructions, or if you live in a building which is made of steel-reinforced concrete (which acts a shield), it may be necessary to install a good outdoor antenna.

- **FM outdoor antenna**

Consult with your dealer or service man about the best method of selecting and erecting an outdoor FM antenna.

The choice of feeder is also important. Flat ribbon-shaped twin lead performs well electrically, and is cheaper and somewhat easier to handle in routing through windows and around rooms. Coaxial cable is more expensive, does a much better job of minimizing interference, is less prone to the effects of weather and close-by metal objects, and is nearly as good a signal conductor as the feeder. The latter is particularly true of foam-type coaxial cables. Coaxial cable is somewhat more difficult to install at the point where the cable enters the building. If coaxial cable is selected, make sure the antenna is designed to drive that type of cable.

NOTE:

An FM outdoor antenna can be connected to the tuner with either a 75 Ω coaxial cable or a 300 Ω feeder. For proper connection, carefully read the instruction manual for the FM outdoor antenna.

Notes for FM antenna installations

- To minimize auto-ignition noise, locate the antenna as far from heavy traffic as possible.
- Keep the feeder or coaxial cable as short as possible. Do not bundle or roll up excess cable.
- The antenna should be at least two meters (6.6 feet) from reinforced concrete walls, or metal structures.

USING TWO FM OUTDOOR ANTENNAS

Since this unit is equipped with A and B antenna terminals, two FM outdoor antennas, oriented in different directions, can be connected, and you can easily select either the A or B antenna with the ANTENNA A/B button on the front panel. This type of antenna installation is a good way to receive high quality signals in an area where broadcast transmitting stations exist in different directions.

Install one antenna at least 2 meters above (or below) the other and orient each antenna in the direction of different broadcast transmitting stations.

CONNECTIONS

(Fig. 14)

OUTPUT jacks

Using the supplied connection cords connect the L (left) and R (right) OUTPUT terminals of the TX-2000 to the L and R tuner input terminals of an amplifier, respectively.

GND terminal

For maximum safety and interference, connect the GND terminal to a good earth ground if practicable. A good earth ground is a metal stake driven into moist earth.

FREQUENCY STEP switch (General Model only)

As the interstation frequency spacing differs in different areas, set the FREQUENCY STEP switch located at the rear according to the frequency spacing in your area.

ANTENNAS

Both AM and FM indoor antennas are included with the TX-2000. Under normal conditions these antennas should be adequate. In general, a properly installed outdoor antenna will give a clearer reception than an indoor one. If you experience poor reception quality, an outdoor antenna may result in improvement.

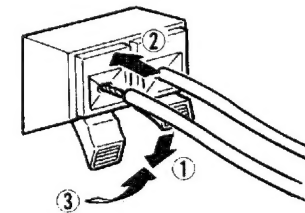
Since the choice and installation of antennas are important for good reception, refer to NOTES ON ANTENNAS.

■ AM ANTENNAS

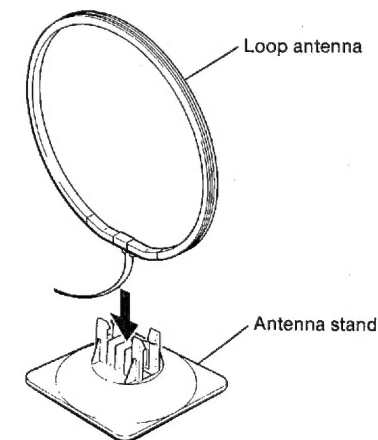
● Supplied indoor AM loop antenna

The included AM loop antenna is designed for indoor use only. Connect the AM antenna leads to the AM ANT terminals.

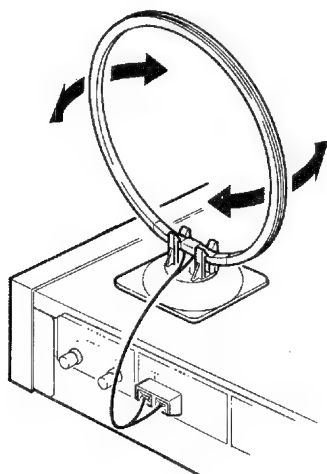
- ① Depress the tabs of AM ANT terminals.
- ② Connect the AM loop antenna leads to the AM ANT terminals.
- ③ Release the tabs. Lightly pull on the leads to confirm a good connection.



- ④ Attach the loop antenna to the antenna stand.



- ⑤ Orient the AM loop antenna so that the best reception is obtained.



* The antenna may be hung on a wall.

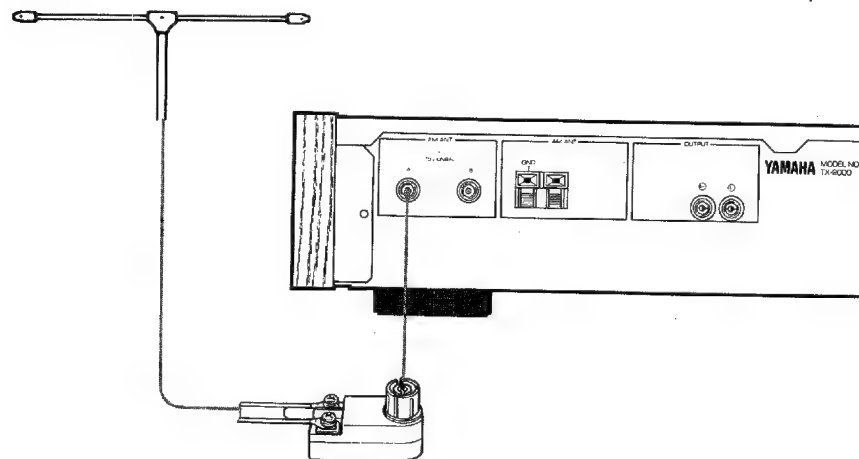
● **Optional outdoor AM antenna**

The end of the wire should be stripped of insulation and connected to the AM ANT terminal. At this time, also keep the loop antenna connected.

■ FM ANTENNAS

● Supplied indoor FM antenna

Connect the supplied indoor antenna to the terminals on the supplied 75-ohm/300-ohm antenna adapter, then insert into the A or B 75Ω UNBAL FM ANT terminal. Move and position the antenna until the best reception is obtained.

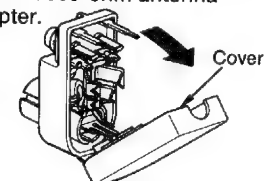


● Optional outdoor FM antenna

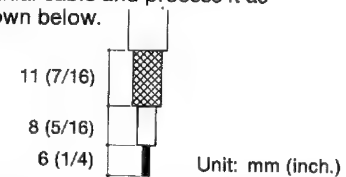
75-ohm coaxial cable connection

1. Connect the coaxial cable to the supplied 75-ohm/300-ohm antenna adapter.

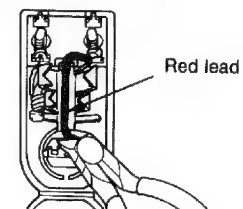
1. Open the cover of the supplied 75-ohm/300-ohm antenna adapter.



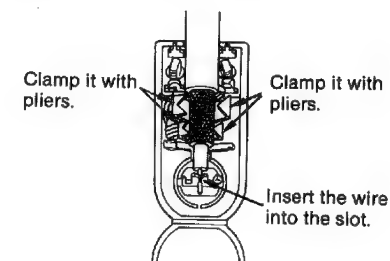
2. Cut the end of the 75-ohm coaxial cable and process it as shown below.



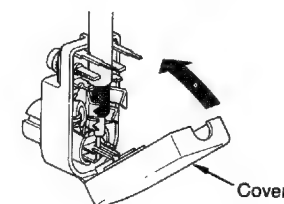
3. Cut the red lead and remove it.



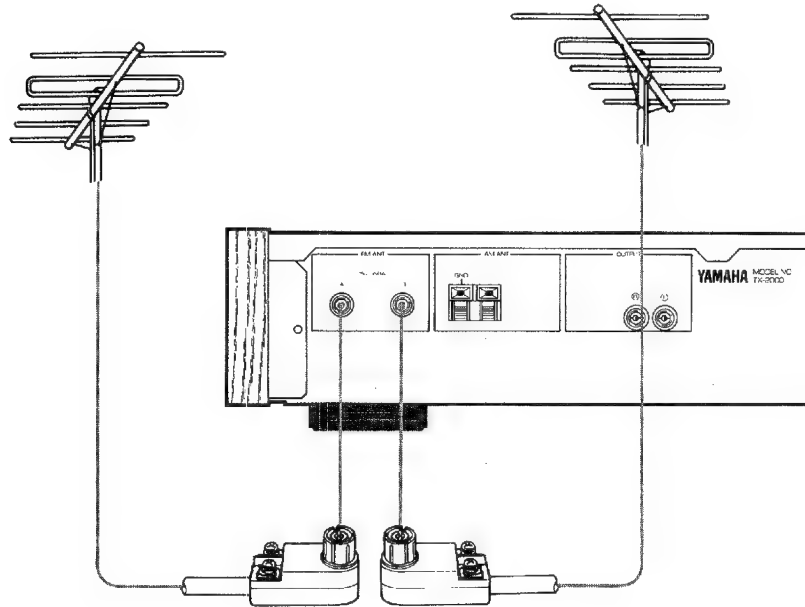
4. Insert the cable wire into the slot as shown below and clamp it with pliers.



5. Snap the cover into its place.

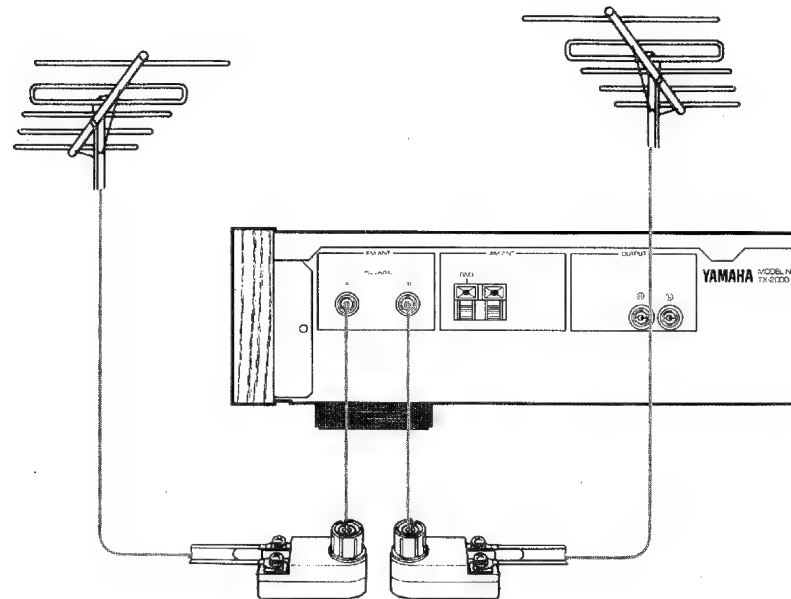


2. Insert the adapter(s) into the A and/or B 75Ω UNBAL FM ANT terminal(s).



300-ohm feeder connection

Connect the 300-ohm feeder to the terminals of the supplied 75-ohm/300-ohm antenna adapter(s), then insert into the A and/or B 75Ω UNBAL FM ANT terminal(s).



FRONT PANEL PARTS AND FUNCTIONS

(Fig. 2)

① POWER switch

Press this switch to turn the power on. Press it again to turn the power off.

② Display window

① Preset station indicator

Lights up to indicate the pressed preset station button.

② STATION FREQUENCY display

Displays the band and frequency of the received station.

③ IF MODE AUTO/NARROW/WIDE indicator

AUTO:

When the Auto IF Mode is selected with the IF MODE AUTO/MAN'L button, this indicator lights.

NARROW/WIDE:

In Manual IF Mode, when the tuning mode is selected with IF MODE NARROW/WIDE button, the corresponding indicator lights.

④ SIGNAL QUALITY indicators

SIGNAL QUALITY meter:

Indicates the level of the received frequency.

If multipath interference is detected, the signal quality level indication decreases.

CSL (Computer Servo Lock):

This indicator lights when the Computer Servo Lock (CSL) system is activated during FM reception mode. For details, refer to "Technical notes on the Computer Servo Lock (CSL) system" described later.

FINE TUNING:

When the FINE TUNING button is operated, this indicator lights.

FM STEREO:

When an FM stereo broadcast with a sufficient signal strength is received, this indicator lights.

⑤ P1-P8/P9-P16/P17-P24 indicators

Indicates the range of the preset station buttons.

⑥ MEMORY indicator

When the MEMORY button is pressed, this indicator blinks for about 5 seconds. During this period, the displayed frequency can be memorized with one of the preset buttons.

⑦ AUTO ST indicator

When the MODE AUTO/MAN'L button is set to AUTO and the MODE FM/MONO button is set to FM to receive an FM broadcast with a sufficient signal, this indicator lights.

⑧ BLEND indicator

Indicates that the BLEND tuning mode is activated with the BLEND button.

⑨ RF ATT indicator

Indicates that the RF ATT tuning mode is activated with the RF ATT button.

⑩ ANT A/B indicator

Indicates the antenna terminal at the rear panel that has been selected with the ANTENNA A/B button.

⑪ AUTO TUNING indicator

Indicates that the AUTO TUNING mode is selected with the TUNING MODE AUTO/MAN'L button.

⑫ LOCK indicator

Indicates that the LOCK function is activated to lock in the required frequency.

③ TUNING control

Tune to the required station by turning this control. This control is also used to select a character for the name of a received station.

④ Preset station buttons

The preset station buttons are used to store up to 24 station frequencies, including reception modes.

⑤ P1-8/P9-16/P17-24 button

Press this button to change the range of the preset station buttons. When this button is pressed, the selected range indicator, (P1-P8, P9-P16, or P17-P24) flickers for about 5 seconds, and then lights.

⑥ MODE AUTO ST/MONO button

To receive an FM stereo broadcast of sufficient signal strength in stereo mode, set the TUNING MODE AUTO/MAN'L button to AUTO and this button to AUTO ST, so that the AUTO ST indicator lights.

To receive a weak FM broadcast, set the TUNING MODE AUTO/MAN'L button to MAN'L and this button to MONO, so that the AUTO ST indicator goes off. The received broadcast is heard in monaural mode.

⑦ MEMEORY button

When this button is pressed, the MEMORY indicator blinks for about 5 seconds. During this period, press the desired preset station button to store the displayed frequency.

This button is also used to memorize the station name.

⑧ BLEND button

If this button is set to ON, and the S/N ratio of a stereo signal is less than about 50 dB, the right and left channel are blended accordingly. When the MODE button is set to MONO, the BLEND function does not work even when this button is set to ON.

⑨ IF MODE buttons

Used to vary the band pass width of the FM intermediate frequency, between WIDE and NARROW.

AUTO/MAN'L:

Used to select the Auto or Manual IF Tuning mode. When the Auto IF Tuning mode is selected, the AUTO indicator lights and the tuner automatically selects the IF band pass width (WIDE or NARROW).

When you want to select the IF band pass width by yourself (Manual IF Tuning mode), press this button so that the AUTO indicator goes off, and then select the IF band pass width with the NARROW/WIDE button.

NARROW/WIDE:

Press this button to select the IF band pass width in Manual IF Tuning mode. Before you operate this button, be sure to press the AUTO/MAN'L button so that the AUTO indicator goes off.

When the reception signal is strong, press this button so that the WIDE indicator lights to obtain distortion-free sound. When the reception signal is weak, or when the desired station is interfered with by adjacent stations, press this button so that the NARROW indicator lights to increase the selectivity.

⑩ RF ATT button

Used to decrease the RF cross modulation and intermodulation. In addition, it can be used together with the IF MODE button to improve the reception signal condition.

When the reception signal is strong, press this button to ON, so that the RF ATT indicator lights. In this position, the RF cross modulation and intermodulation will be decreased.

To receive a distant FM broadcast, press this button to OFF, so that the RF ATT indicator goes off, to obtain a better S/N ratio.

⑪ FM/AM button

Press this button to select the reception band between FM and AM. The STATION FREQUENCY display will change according to this button setting.

⑫ ANTENNA A/B button

Used to select the antenna terminal at the rear panel. The ANT A or B indicator lights to show the activated antenna terminal.

⑬ TUNING MODE buttons

AUTO/MAN'L:

Used to select the tuning mode, between Auto and Manual. For Auto Tuning mode, press this button so that the AUTO TUNING indicator lights. For Manual Tuning mode, press this button so that the AUTO TUNING indicator goes off.

FINE:

Press this button to precisely tune the station with Manual tuning.

When this button is pressed, the displayed frequency changes by 0.01 MHz for FM and 1 kHz for AM band.

14 LOCK button

Used to lock-in the frequency of the broadcast, so that drift-free FM reception is possible.

ON:

Setting this button to ON locks-in the required frequency, even when there are changes in temperature and humidity. This function is useful when making long FM broadcast recording.

* The preset stations will be received with the preset station buttons even when the LOCK button is set to ON.

OFF:

Use when receiving a weak FM broadcast, especially when there is an adjacent strong station interfering with the required station.

15 STATION DISPLAY buttons


ON/OFF:

Press this button to edit the name of a received frequency. The STATION FREQUENCY display will disappear, and " - - - " will appear. This display shows that the unit is in edit mode.

SHIFT:

Press this button to enter the character which was selected with the TUNING control.

16 REMOTE CONTROL sensor

Receives the signal from the supplied remote control transmitter or a YAMAHA transmitter with the  mark.

Technical notes on the Computer Servo Lock (CSL) system

The new Yamaha Computer Servo Lock Tuning system eliminates many conventional tuning problems by effectively providing two different tuning modes, each optimized for different types of reception conditions, and both controlled by a sophisticated microprocessor. The microprocessor discriminates between different reception conditions and selects the appropriate tuning mode according to the quality of the received signal. If the station has a strong, high quality signal, an infinite resolution FM stereo tuning circuit is used for maximum audio quality. With a weak, poor quality signal, the PLL tuning mode locks on to the broadcast frequency to ensure the best possible reception.

REMOTE CONTROL TRANSMITTER

■ OPERATION KEYS (Fig. 3)

① PRESET P1-8/P9-16/P17-24 key

Press this key to select the preset station range.

② Preset station keys

Press one of these keys to select a preset station. To do so, first select the preset station range, and then press the corresponding key to receive the desired station.

■ BATTERY INSTALLATION (Fig. 4)

The remote control unit uses 2 batteries (size "AA", R06). Install them according to the following illustration. Be sure that they are installed correctly.

■ BATTERY REPLACEMENT

When the remote control operating distance becomes short, the batteries are weak. Replace the two batteries with new ones.

Battery cautions

Incorrect use of a battery may cause leakage or an explosion. Be careful of the following items:

When replacing:

- Replace only with "AA" (R06) batteries.
- Place the batteries in correct (+) and (-) polarities as indicated in the battery compartment.
- Do not use an old battery with a new one.
- Do not use different kinds of batteries (alkaline, heavyduty, manganse, Ni-Cad, etc.) at the same time.

Care of the remote control transmitter:

- When the remote control transmitter will not be used for an extended period of time, remove the batteries.
- Replace weak batteries early.

To prevent accidents:

- Never disassemble, heat, or throw a battery into a fire. Dispose of batteries in specified places.
- Never connect (short) the (+) and (-) terminals directly with a metal piece, wire, etc.
- There are two kinds of batteries on the market; rechargeable and non-rechargeable. Carefully read all caution labels on the batteries.

In case of leakage:

Wipe off the electrolyte in the battery compartment completely before installing new batteries.

■ OPERATION RANGE (Fig. 5)

The remote control unit should point toward the amplifier and be within 7 meters (23 feet) and 30 degrees to the perpendicular of the amplifier for proper operation.

OPERATION

Since there are three ways to tune in a station, you should select the best method according to the signal strength or your preference.

AUTO TUNING:

To find and receive a station of sufficient signal strength.

MANUAL TUNING:

To receive a weak station.

PRESET TUNING:

To receive a preset station with single touch tuning.

AUTO TUNING

If station signals are strong and there is no interference, quick automatic search tuning is possible.

1. Select the reception band with the FM/AM button.
2. If two FM outdoor antennas are connected, select either the A or B antenna terminal with the ANTENNA A/B button.
3. Press the TUNING MODE AUTO/MAN'L button so that the AUTO TUNING indicator lights.
4. For FM reception, set the MODE, BLEND, IF MODE and RF ATT buttons as desired.
5. Use the TUNING control to tune in a station. To tune to a higher frequency, slightly turn the control to the right. To tune to a lower frequency, slightly turn the control to the left.
Tuning will start automatically and stop at a broadcast station frequency of sufficient signal strength.
* Be sure to set the LOCK button to OFF. Otherwise, the TUNING control will not function.
6. If the station where tuning stops is not the one you want, slightly turn the control in the desired direction.

MANUAL TUNING

Auto Tuning may be impossible if the station signal is weak. If so, use Manual Tuning.

1. Select the reception band with the FM/AM button.
2. If two FM outdoor antennas are connected, select either the A or B antenna terminal with the ANTENNA A/B button.
3. Press the TUNING MODE AUTO/MAN'L button so that the AUTO TUNING indicator goes off.
4. For FM reception, set the MODE, BLEND, IF MODE and RF ATT buttons as desired.
5. Use the TUNING control to tune in a station.
To tune to a higher frequency, turn the control clockwise.
To tune to a lower frequency, turn the control counterclockwise. Release it just before reaching the required frequency, and then turn it slightly and slowly until the required frequency is tuned in.
* Be sure to set the LOCK button to OFF. Otherwise, the TUNING control will not function.

● **Fine Tuning**

Rapid tuning is usually possible with the Auto or Manual Tuning method, but more stabilized reception is possible with Fine tuning in the follows situations.

- To receive a weak or very badly fading broadcast signal from among many signals
- To receive a weak or medium-strength signal which is near a strong signal
- If beat noise is received

In these instances, Manual Tuning and then Fine Tuning can be used to reduce noise and distortion.

Set the TUNING MODE AUTO/MAN'L button to MAN'L, and then press the TUNING MODE FINE button, so that the FINE TUNING indicator lights.

The best reception can be easily obtained by using the SIGNAL QUALITY meter during fine tuning.

PRESET TUNING

The preset station buttons can be used to select, with a single touch, any desired station which has been preset.

1. Tune to the desired station using Auto or Manual TUNING.
 2. Select the range of the preset station buttons with the P1-8/P9-16/P17-24 button.
 3. Press the MEMORY button and then while the MEMORY indicator is flickering, press the desired preset station button.
 4. Follow the same procedures 1 to 3 for the other preset station buttons.
 5. To recall a preset station, first select the range of the preset station buttons with the P1-8/P9-16/P17-24 button, and then press the desired preset station button.
- A new setting will be programmed in place of a former one.
 - For FM reception, the settings of the MODE, BLEND, IF MODE, RF ATT, ANTENNA, and TUNING MODE FINE buttons and stations names are stored along with the station frequency.
 - This unit automatically remembers the last tuned-in station when power is turned OFF. When power is turned back ON, the same station will be received.

• Naming a station to be preset

You can preset a station by name instead of by frequency. The characters of the name can be selected from among the alphabet and numerals (up to 4 characters).

With the station name, you can easily find a desired station even when you are not sure of that station's frequency.

1. Tune to the desired station to be memorized with either automatic or manual tuning.
2. Press the STATION DISPLAY ON/OFF button.
The STATION FREQUENCY display will show " - - - - ".
3. Press the STATION DISPLAY SHIFT button.
The STATION FREQUENCY display will show " A - - - ".
4. Turn the TUNING control to select the first character to be memorized.
5. When the desired character appears, press the DISPLAY SHIFT button to memorize it. The blinking first character will light steadily, and the second character position will start to blink.
6. Repeat steps 5 and 6 for the other characters, if necessary.
7. Select the range of the preset station buttons with the P1-8/P9-16/P17-24 button.
8. Press the MEMORY button and then while the MEMORY indicator is flickering, press the desired preset station button.

When one of these preset stations is recalled, the station name appears instead of the station frequency.

• Memory back-up

The memory back-up circuit prevents the programmed information from being lost even though power is switched OFF for timer use or due to temporary power failure. If, however, if the unit is not used for a long time, the memory may be erased. If so, it can be re-programmed by simply following the PRESET TUNING procedure.

TROUBLESHOOTING

When your unit fails to function properly, before assuming it is faulty, check it according to the following troubleshooting list. It details the corrective action you can take yourself without having to call a service engineer. If you have any doubts or questions, get in touch with your nearest YAMAHA dealer.

	SYMPTOM	CAUSE	REMEDY
FM	Crackling sounds from time to time (especially in weak signal areas).	• Ignition noise from passing vehicles.	• The FM antenna should be put up as high as possible, away from the road, and a coaxial cable used.
		• Noise from thermostats or other electrical equipment.	• Attach a noise suppressor to the equipment causing the noise.
	FM stereo reception is noisy.	• Because of the characteristics of FM stereo broadcasts, this is limited to cases where the transmitter is far away or the antenna input is poor.	• Check the antenna connections. • Try using a multiple element FM antenna. • Set the TUNING MODE button to MAN'L mode.
	The FM STEREO indicator flickers and reception is noisy.	• Insufficient antenna input.	• Use an antenna appropriate for the reception condition in your area.
		• Not tuned correctly.	• Tune again.
	There is distortion and clear reception cannot be obtained even with a good FM antenna.	• There is multipath interference.	• Adjust antenna placement to eliminate multipath interference.
	No stereo effect even with a stereo broadcast.	• The TUNING MODE button, is set to MAN'L.	• Set the button properly.
	A desired station cannot be tuned in with Auto tuning.	• The station is too weak.	• Use Manual tuning mode. • Set the IF MODE correctly. • Use high quality directional FM antenna.
	Previously preset stations can no longer be tuned in.	• The tuner has been unplugged for a long period.	• Repeat the presetting procedure.
AM	Insufficient sensitivity.	• Weak signal or loose antenna connections.	• Tighten the AM loop antenna connections and rotate it for best reception.
	A desired station cannot be tuned in with Auto tuning.		• Use Manual tuning mode.
	There are continuous crackling and hissing noises.	• These noises result from lightning, florescent lamps, motors, thermostats and other electrical equipment.	• Use an outdoor antenna and a ground wire. This will help some what but it is difficult to eliminate all noise.
	There are buzzing and whining noises (especially in the evening).	• Another station is interfering with the received station.	• This is impossible to remedy.
		• A television set is being use nearby.	• Move the television away.

SPECIFICATIONS

FM SECTION

Tuning Range	87.6 to 108 MHz
50 dB Quieting Sensitivity (IHF), 75 ohms (Except for Europe model)	
Mono	1.6 μ V (15.3 dBf)
Stereo	20 μ V (37.2 dBf)
Usable Sensitivity (Except for Europe model)	
(30 dB Quieting, NARROW)	
75 ohms	0.9 μ V (10.3 dBf)
Usable Sensitivity (Europe model)	
(DIN) 75 ohms Mono (S/N 26 dB)	0.3 μ V
Stereo (S/N 46 dB)	22 μ V
Image Response Ratio	95 dB
IF Response Ratio	115 dB
Spurious Response Ratio	110 dB
AM Suppression Ratio	70 dB
Capture Ratio	1.2 dB (WIDE)
Alternate Channel Selectivity	90 dB (NARROW)
	(Except for Europe model)
Selectivity	80 dB (\pm 300 kHz, NARROW)
	(40 kHz Dev.) (Europe model)
Signal-to-Noise Ratio	
(IHF) (Except for Europe model)	
Mono	98 dB
Stereo	90 dB
(DIN-NOISE RMS) (Europe model)	
Mono (40 kHz Dev.)	86 dB
Stereo (40 kHz Dev.)	79 dB
Distortion:	
Mono (1 kHz)	0.02% (WIDE)
Stereo (1 kHz)	0.03% (WIDE)
Stereo Separation:	
1 kHz	68 dB (WIDE)
Frequency response:	
50 Hz to 10 kHz	0 \pm 0.2 dB, 0 \pm 0.3 dB
20 Hz to 15 kHz	0 \pm 0.2 dB, 0 \pm 0.5 dB
Subcarrier Product Ratio	65 dB

AM SECTION

Tuning Range:	
U.S.A, Canada and general models	520 — 1620 kHz
Europe, U.K. and general models	522 — 1620 kHz
Usable Sensitivity	
U.S.A, Canada and U.K. models	100 μ V/m
Europe and general models	250 μ V/m
Selectivity	32 dB
Signal-to-Noise Ratio	52 dB
Image Response Ratio	40 dB
Spurious Response Ratio	50 dB
Distortion	0.3%

AUDIO SECTION

Output Level/Impedance: (NORMAL)

FM (100% mod., 1 kHz)	500 mV/1 k-ohms
	(Except for Europe model)
FM 40 kHz Dev.	400 mV/1 k-ohms
	(Europe model)
AM (30% mod., 400 Hz)	150 mV/1 k-ohms

GENERAL

Power Supply

Europe model	220V, 50 Hz
U.K. model	240V, 50 Hz
General model	110 — 120/220 — 240V, 50/60 Hz
U.S.A and Canada models	120V, 60 Hz

Power Consumption

15W

Dimensions (W x H x D)

473 x 95.5 x 366.5 mm

(18-5/8" x 3-3/4" x 14-7/16")

Weight

7.1 kg (15 lbs. 10 oz.)

Specifications subject to change without notice.

YAMAHA

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